Foundations are structure members having different types of design that carry and transmit the dead, live and earthquake loads of structure. Foundation plans are drawn with 1/50 or 1/100 scale according to size of building.

**Given informations about construction on foundation plan:**
- The name (BK1) and size (30/30) of lintel beams in case of single or continuous foundations
- The name (T1) and size (60/90) of continuous foundation beams
- The name (T2) and size (150/170) of single footings
- Size of encasement (socket) of foundation
- Names and measurements of both foundation and axis
- Names of columns (S101, S102)
- The properties and size informations of under foundation materials (Grading concrete, lean concrete, isolation etc.) in cross section view of foundation plan
- Class of concrete, steel using in foundation (C20, ST420)
- Maximum and minimum elevations of foundation
Columns and shear walls can not be settled soil directly. Strength of reinforced concrete is too higher than strength of soil (100~200 times). So, while these cross sections settle soil directly, too much stresses occur. Reinforced concrete members - having large cross section area according to column - as slab, plate, beam (foundation members) are built between bottom point of column and soil in order to decrease the stress on soil.

Decreasing the stress on soil is not single purpose of foundations. Another important aim is, keeping the soil settlement in limited range under column or shear wall and prevent the damage of upperstructure from different settlements. Even as the same settlement in all columns do not give any damage to upperstructure, different settlements may be too dangerous.
Effect the settlements of soil on the upperstructure according to different foundation types

- Uniformly settlement - Crack is not occur
- Rigid twist - Generally crack is not occur
- Different settlement - Generally wide cracks are occur
TYPE of FOUNDATIONS

1. Under Wall Foundation
2. Single Footing
3. Conjugated Foundation
4. Continuous Foundation
   a) Along one direction
   b) Along two direction
5. Mat Foundation
   a) Plate Mat Foundation (Without beam)
   b) Mat Foundation with Beam
6. Pile Foundation
7. Caissons

- Strong Soil
- Weak Soil
- Low Cost
- High Cost

Shallow Foundations
Deep Foundations
Stone or Reinforced Concrete Underwall Foundation

Load from upper structure

Perspective View
Plan and Perspective of Single Footing

- Lintel Beam
- Column
- Footing

Perspective View
Perspective View of Conjugated (Continuous) Foundation

\[ N_{d1} \approx N_{d2} \]

\[ N_{d1} << N_{d2} \]

\[ N_{d1} >> N_{d2} \]
Cross Section Views of Different Foundation Types

CONTINUOUS FOUNDATION

MAT FOUNDATION (Beams at Top)
Cross Section Views of Different Foundation Types

MAT FOUNDATION (Beams at Bottom)

MAT FOUNDATION (Without Beam)
CONTINUOUS FOUNDATION ALONG ONE DIRECTION
Plan and Cross Section View of Continuous Foundation

Continuous Foundation Along Two Direction

- Column
- Footing
- Beam

Plan
Perspective View of Continuous Foundation
Plan and Cross Section View of Mat Foundation

Plate Mat Foundation (without beam)

Column

Plan

Thick Plate
Pile Foundation and Cross Section View

Structure

Weak Soil

Pile

Strong Soil

Foundation Platform

Soil

Pile

Column

Foundation Platform

Pile

Pile Foundation of Bridge Piers
Different Foundation Types

- Column Reinforcements
- Footing

Single Footing

- Conjugated and single foundation
- Column Formwork
- Socket
- Lintel Beam

Conjugated Foundation

- Single Footing
- Conjugated and single foundation
Continuous Foundation Along One Direction

Beam Reinforcements

Column Reinforcements

Footing (Encasement)

Continuous Foundation Along One Direction
Continuous Foundation Along Two Direction: Reinforcements are placed

Footing Reinforcements

Beam Reinforcements
Mat Foundation With Beam

Mat Foundation after formworks are removed

Column Reinforcements

Slab

Beam
Plan of Continuous Foundation Along Two Direction
Plan and Cross Section Views of Some Foundations

Foundation of Stone Wall (A-A section)

Single Footing (B-B section)

Stepped Single Footing (C-C section)

Plan of Stone Wall

Plan of Single Footing

Plan Of Stepped Single Footing
Plan and Cross Section Views of Some Foundations

Plan of Continuous Foundation

Perspective View of Two Directional Continuous Foundation Plan

Foundation Beam
Footing
Sand and lean concrete respectively